Mapping Alluvial Fan Surfaces in Western China with Remote Sensing Data

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Geomorphic surfaces arc the libraries of past climate than.gc in arid continental regions. Landforms and the stage of evolution of surfaces preserve evidence of past climates as far back as the early Quarternary. Landforms such as alluvial fans arc well distributed in space and time so that maps of their locations and ages help define paleoclimatic patterns and gradients within arid continent al interiors.

Remote sensing and digital topographic techniques have been used for some time to map major aggradational units on alluvial fans in the southwestern U.S. Visible-near infrared and thermal infrared sensors map compositional characteristics related to rock coating development, soil formation, and the concentration of resistant lithologies. Radars map roughness variations related to physical weathering, colian deposition, and fluvial dissection. Digital topography has been used to determine details of the uplift and dissection of individual fan units

The two flights of the Spaceborne Radar Laboratory (SIR-C; /X-SAR) have allowed ncw radar image data to bc collected in the continental interior of western China, where little information on paleoclimates exist. Combined with French SPOT high-resolution panchromatic images and high-resolution digital topographic data derived from ERS-1 and SIR-C interferometry, the SIR-C/X-SAR images allow recognition of alluvial fan units similar to those in the southwest U.S. An area along the Altyn Tagh fault has been mapped in some detail using these data. Field observations show that the units are distinguished on the basis of the same processes operating in the southwest U.S. Determination of process rates awaits dating of the units, to be accomplished later this year.

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